



# Missile Defense Agency

## Cost Research Activities

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# MDA Cost Centers

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## Center

## Focus

MDA/PIE

All MDA Systems

GMD Program Office

Radar, Interceptors, BMC3

KE Boost Program Office

Radar, Interceptors, BMC3

STSS Program Office

Passive Sensors, Launch Vehicles,  
Satellite Bus

Airborne Laser Program Office

Directed Energy

THAAD Program Office

Radar, Interceptors, BMC3

Patriot Program Office

Radar, Interceptors, BMC3

Aegis BMD Program Office

Radar, Interceptors, BMC3

Army SMDC

Radar, Interceptors, BMC3, Targets  
and Ranges



# MDA Cost Research Products

## Recently Completed

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### Missiles

- Missile Cost Improvement Slope Analysis
- Missile Cost Model Version 3.12
- THAAD Robust Analog Methodology (TRAM) Model

### Sensors

- Ground Based Radar Cost Model
- MDA Radar Cost Model Version 1.

### BMC3

- Theater Air and Missile Defense Interoperability Cost Model

### Space and Directed Energy

- Deployable Optics Development and Manufacturing

### Other

- Environmental Life Cycle Cost Model
- Cost Differential to Harden MDA Systems Study
- Installation Base Operations Cost Estimating Support Guide



# MDA Cost Research Products

## Ongoing

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### Missiles

- Strategic Missile Model Update
- Missile Development Engineering Cost Study
- Propulsion System CER

### Sensors

- Radar Schedule Estimating Relationship Analysis

### BMC3

- Electronics and Digital Cost Processing Database

### Space and Directed Energy

- Space System Cost Improvement Slope Analysis
- Space Program Database

### Other

- MDA Missile and Radar Cost and Performance Database
- Improvements to the MDA Cost Risk Methodology
- MDA Target and Payload Cost Model



# New Technology Programs

## Areas of Interest

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- Miniature Kill Vehicle (Missile Area)
- High Altitude Airship (Sensors Area)
- Advanced Discrimination (BMC3I Area)
- Laser Radar – LADAR (Sensor & Missile Areas)
- Next Generation Radar (Sensors Area)
- Forward Based Radar (Sensors Area)
- Micro Satellites (Sensor & Space Areas)

⇒ Our challenge is to discover improved methodologies to estimate costs for development of these technologies and for integrating them into the Ballistic Missile Defense System (BMDS) and Program Elements.

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# MDA Cost Research Workshop

## 14-15 November 2002

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- **Participants included MDA, the Services, OSD Agencies, and the Intelligence Community.**
- **Purpose:**
  - Establish a line of communications across the cost community where we can share information about existing, on-going, and proposed cost research projects, databases, and models.
  - Use the workshop to discuss the strengths and weaknesses of our existing tools.
  - Develop research priorities, by commodity area, that meet our most urgent needs for the next year or two.
- **Focused on evolutionary, capabilities-based estimating**
  - How will this change the tools we need to do cost estimating?
  - What is the impact on how we collect data, build databases, and perform research?

Work Group Structure			
Work Group	Co-Chairs		Alternate
Missiles	Bill Seeman	Amanda Cardiel	Chris Beatty
Radar and Sensors	Steve Miller	Jack Calvert	Bill Shelton
Space and Directed Energy	Jon Sweet	Brett Smith	Pat Gilcrest
BMC <sup>3</sup>	John Maurer	Marc Barden	Rick Wendel

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# Research Objectives Common Across Working Groups

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- **Consolidate and standardize cost, performance, technical, and programmatic databases.**
  - Leverage off existing databases and adopt the best of what is available
  - Aggressively pursue technical, performance, and programmatic data for inclusion in the database
    - most databases are weak in these areas.
- **Standardize CER documentation** to enhance CER usability and traceability.
  - Standardize statistics and what they represent
  - Provide the data set so that the analysis can be performed with data subsets or new systems when necessary by any user.
- **Develop and update CERs both using performance based and physical/technical characteristic independent variables** – these CERs are needed to support capability based cost estimating.
- Research and **develop methods that estimate costs for incremental development efforts** to support MDA's evolutionary development environment.
- **Develop improved CERs for estimating nonrecurring costs** – these are the hardest to estimate.
- **Develop improved methodologies to estimate software development costs** – although we use commercial software estimating packages, we need to develop other methods to cross-check estimates.



# The Way Ahead – MDA/CAIG

## New Way of Doing Business

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- **The MDA is committed to providing mission capable systems to the defend our nation, deployed US Forces, and our allies at the earliest possible opportunity.**
  - To do this we have adopted an evolutionary acquisition process that delivers capability in block increments.
  - So that we are ready to deliver, our CARDS and Cost Estimates are updated continuously – not just prior to DAB reviews.
- MDA and OSD CAIG will establish a Ballistic Missile Defense System (BMDS) Cost Working Integrated Product Team (CWIPT).
  - OSD CAIG is invited to participate in all MDA cost estimating working groups and influence our cost estimates – from the beginning.
  - The CWIPT will develop and maintain a set of cost models and shared databases.
  - The CWIPT will identify and prioritize research areas/topics for studies to improve the models and databases.
- The OSD CAIG continues to develop Independent Cost Estimates (ICEs) for the approved BMDS elements/components at Off-Ramp (in support of DAB decision reviews. However:
  - We already know the opinion of the assigned CAIG analyst and have had the opportunity to address any concerns.
  - The CAIG analyst has the opportunity to develop and maintain a “Working ICE” shortening the timeline to prepare for a DAB.





# The Way Ahead - MDA Cost Research

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- Continue to utilize the work groups to achieve consensus on priorities, to support information sharing, and to generate needed energy.
- Use MDA research \$\$\$ to fund the most critical of the research projects.
- Leverage off ongoing activities to maximize impact of research \$\$\$.
- Use future research workshops to assess how we are doing, to pick up and/or maintain momentum on priority projects, to allow for interchange between work groups, and to recognize key contributors.

## ⇒ What else I would like to see:

- **An OSD CAIG led, web-based central repository of all raw data – cost, technical, performance, programmatic.**
  - Using agreed upon data formats and software that is common to most government agencies.
  - Data need be collected and entered into the database only once
  - Emphasis/focus should be on the analysis of the data (this is where the \$\$ should go).
- **An agreement across the larger cost community that data collected by a contractor for a given project is available to any government agency.**